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MYERS BIGEL SIBLEY & SAJOVEC
PO BOX 37428
RALEIGH, NC 27627

EXAMINER	
KUMAR, PANKAJ	

ART UNIT	PAPER NUMBER
2631	3

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/695,357	Applicant(s) BALACHANDRAN ET AL.	
	Examiner Pankaj Kumar	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *49* is/are allowed.

6)☒ Claim(s) *1-3,5-9,11-19,21-26,28,29,31-40,42,43,45-48 and 50* is/are rejected.

7)☒ Claim(s) *4,10,20,27,30,41 and 44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 3, 6, 9, 11, 12, 13, 14, 16, 18, 19, 21, 22, 23, 24, 25, 28, 29, 47, 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Eswara 6,597,927.

3. As per claim 1, a cellular communication system, comprising: a plurality of base station transceivers (Eswara fig. 1: 18, 20, 22, 24, 26); at least one base station controller (Eswara fig. 1: 16) that is configured to control the plurality of base station transceivers (Eswara fig. 1: 16 controls 18, 20, 22, 24, 26); and a cell group that comprises a plurality of cells (Eswara fig. 1: 28, 30) that are respectively associated with the plurality of base station transceivers (Eswara fig. 1: 18, 20) and with a plurality of primary frequencies, such that in each of the plurality of cells the respectively associated base station transceiver uses the respectively associated primary frequency to communicate control information (Eswara col. 1 lines 27-28: "control channel frequency is used for each sector."), communication of the control information being constrained to the respectively associated primary frequency (Eswara col. 1 lines 34-35: separate control channel for each sub-sector), and uses coordinated frequency hopping over the plurality of primary frequencies to communicate traffic information (Eswara col. 4 line 56 to col. 5 line 15: hopping between beacons A, B, C etc.).

4. As per claim 2, the cellular communication system as recited in Claim 1, wherein the coordinated frequency hopping is cyclical (Eswara col. 4 line 56 to col. 5 line 15: it is cyclical since as a user moves between beacons, they can only move cyclically with respect to the beacons and thus the beacons will be hopped to cyclically).

5. As per claim 3, the cellular communication system as recited in Claim 1, wherein the coordinated frequency hopping is random (Eswara col. 4 line 56 to col. 5 line 15: it is random since it is based on signal strength which is random).

6. As per claim 6, the cellular communication system as recited in Claim 1, wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of primary frequencies (Eswara fig. 4: U/X exists in the same bandwidth as A, B, C, D).

7. As per claim 9, a cellular communication system, comprising: a base station subsystem; and a mobile terminal that is configured to use a control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency, and is configured to use coordinated frequency hopping over a plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem (discussed with Eswara).

8. As per claim 11, the cellular communication system as recited in Claim 9, wherein the coordinated frequency hopping is cyclical (discussed with Eswara).

9. As per claim 12, the cellular communication system as recited in Claim 9, wherein the coordinated frequency hopping is random (discussed with Eswara).

10. As per claim 13, the cellular communication system as recited in Claim 9, wherein the base station subsystem is configured to transmit a hopping sequence to the mobile terminal using the control frequency (Eswara col. 1 lines 62-64: "One of the functions provided by the DCCH is to relay ... channel allocations ..."; frequency to hop to is determined based on signal strength).

11. As per claim 14, the cellular communication system as recited in Claim 9, wherein the plurality of traffic frequencies and the control frequency are mutually exclusive (Eswara: control frequencies only for control and traffic frequencies only for traffic and thus they are mutually exclusive; paragraph 7: control channel "provides the system identity").

12. As per claim 16, the cellular communication system as recited in Claim 9, wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies. (discussed with Eswara)

13. As per claim 18, the cellular communication system as recited in Claim 9, wherein the plurality of traffic frequencies comprise the control frequency (discussed with Eswara).

14. As per claim 19, Eswara teaches a method of communication between a mobile terminal and a base station subsystem, comprising: assigning a control frequency to a cell in which the mobile terminal is located; using the control frequency to exchange control information between the mobile terminal and the base station subsystem (discussed up to here with Eswara), the exchange of control information being constrained to the control frequency (Eswara has control information only going through the control channels); assigning a plurality of traffic frequencies to the cell in which the mobile terminal is located; and using coordinated frequency hopping over the plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem (remainder discussed with Eswara).

15. As per claim 21, the method as recited in Claim 19, wherein the coordinated frequency hopping is cyclical (discussed with Eswara).

16. As per claim 22, the method as recited in Claim 19, wherein the coordinated frequency hopping is random (discussed with Eswara).

17. As per claim 23, the method as recited in Claim 19, further comprising: transmitting a hopping sequence to the mobile terminal using the control frequency (discussed with Eswara).

18. As per claim 24, the method as recited in Claim 23, wherein transmitting the hopping sequence to the mobile terminal using the control frequency comprises: transmitting the hopping sequence to the mobile terminal using a primary packet broadcast control channel (PBCCH), which is defined by the control frequency and at least one time slot (Eswara col. 1 lines 62-64: "One of the functions provided by the DCCH is to relay ... channel allocations ..."; frequency to hop to is determined based on signal strength; col. 2 lines 10-15: "in a TDMA ... cellular system, begins transmitting on a traffic channel ... followed by a start measurement ... on the ... control channel").

19. As per claim 25, the method as recited in Claim 19, wherein the plurality of traffic frequencies and the control frequency are mutually exclusive (discussed with Eswara).

20. As per claim 28, the method as recited in Claim 19, wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies (discussed with Eswara).

21. As per claim 29, the method as recited in Claim 28, wherein the traffic frequencies are non-contiguous and are each separated, one from another, by at least one of the frequencies associated with the auxiliary cellular communication system (discussed with Eswara).

22. As per claim 47, a cellular communication system, comprising: a plurality of base station transceivers; at least one base station controller that is configured to control the plurality of base station transceivers; and a cell group that comprises a plurality of cells that are respectively associated with the plurality of base station transceivers and with a plurality of control frequencies, such that in each of the plurality of cells the respectively associated base station transceiver uses the respectively associated control frequency to communicate control information, communication of the control information being constrained to the respectively associated control frequency, and uses coordinated frequency hopping over the plurality of traffic frequencies to communicate traffic information, the plurality of control frequencies and the plurality of traffic frequencies being mutually exclusive. (discussed with Eswara)

23. As per claim 48, a cellular communication system, comprising: a base station subsystem; and a mobile terminal that is configured to use a control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency, and is configured to use coordinated frequency hopping over a plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem; wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies. (discussed with Eswara)

24. Claims 19, 31, 32, 45, 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Barany 6,256,486.

25. As per claim 19, Barany teaches a method of communication between a mobile terminal and a base station subsystem, comprising: assigning a control frequency to a cell in which the mobile terminal is located (Barany col. 14 last paragraph: "... control channels ... provide general information on a per base station basis ..."); using the control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency (Barany col. 14 last paragraph: control information for control frequencies – inherently inefficient if duplicated in other frequencies); assigning a plurality of traffic frequencies to the cell in which the mobile terminal is located (Barany col. 15 lines 7-9: "... data traffic channels ... and associated traffic control channels ..."); and using coordinated frequency hopping over the plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem (Barany figs. 2, 3, 10, 11: hopping between various frequencies while moving between coverage areas).

26. As per claim 31, the method as recited in Claim 19, wherein each of the plurality of traffic frequencies is associated with an equivalence class of frequencies and wherein using coordinated frequency hopping over the plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem comprises (preamble is not afforded patentable weight): randomly (Barany col. 14 lines 55-56: random access channel) selecting a frequency from each of the plurality of equivalence classes of frequencies (Barany col. 14 last paragraph; paragraph 64: "PAGCH is used to allocate a channel to a mobile unit 20 for signaling to obtain a dedicated channel following a request by the mobile unit 20 on PRACH."); and using the randomly selected frequencies to communicate traffic information

between the mobile terminal and the base station subsystem (Barany col. 14 lines 57-58, 60-62: random access channel used to request access to system and allocating a channel to a mobile unit following a request on the random access channel).

27. As per claim 32, Barany teaches the method as recited in Claim 19 wherein the plurality of traffic frequencies comprise the control frequency (Barany paragraph 4: "In one embodiment, the base station 18 and mobile units 20 in each cell 14 are capable of communicating with two sets of carriers--a first set of carriers 26 for communicating circuit-switched traffic (e.g., speech data, short messaging services, and other circuit-switched data) and associated control signals; and a second set of carriers 28 for communicating packet-switched data traffic and associated control signals.")

28. As per claim 45, the computer program product as recited in Claim 33, wherein each of the plurality of traffic frequencies is associated with an equivalence class of frequencies and wherein the computer readable program code for using coordinated frequency hopping over the plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem comprises: computer readable program code for randomly selecting a frequency from each of the plurality of equivalence classes of frequencies; and computer readable program code for using the randomly selected frequencies to communicate traffic information between the mobile terminal and the base station subsystem. (discussed with respect to Barany)

29. As per claim 50, a method of communication between a mobile terminal and a base station subsystem, comprising: assigning a control frequency to a cell in which the mobile terminal is located; using the control frequency to exchange control information between the

mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency; assigning a plurality of traffic frequencies to the cell in which the mobile terminal is located, each of the plurality of traffic frequencies being associated with an equivalence class of frequencies; randomly selecting a frequency from each of the plurality of equivalence classes of frequencies; and using the randomly selected frequencies to communicate traffic information between the mobile terminal and the base station subsystem. (discussed with respect to Barany)

Claim Rejections - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

31. Claims 5, 7, 15, 17, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eswara.

32. (103) As per claim 5, Eswara teaches the cellular communication system as recited in Claim 1. What Eswara does not teach is wherein the primary frequencies are non-contiguous. It would have been obvious to one skilled in the art at the time of the invention to modify Eswara to teach that the primary frequencies are non-contiguous. One would be motivated to do so since, when determining signal strengths, non-contiguous frequencies would have signal strength differences that are more pronounced and thus it would be easier to know what frequency to switch to that if frequencies were adjacent.

33. (103) As per claim 7, Eswara teaches the cellular communication system as recited in Claim 6, wherein the primary frequencies are ~~non-contiguous and are~~ each separated, one from another, by at least one of the frequencies associated with the auxiliary cellular communication system (Eswara fig. 4: U/X exists in the same bandwidth as A, B, C, D). What Eswara does not teach is that the primary frequencies are non-contiguous. It would have been obvious to one skilled in the art at the time of the invention to modify Eswara to teach that the primary frequencies are non-contiguous. One would be motivated to do so since, when determining signal strengths, non-contiguous frequencies would have signal strength differences that are more pronounced and thus it would be easier to know what frequency to switch to that if frequencies were adjacent.

34. (103) As per claim 15, the cellular communication system as recited in Claim 9, wherein the traffic frequencies are non-contiguous. (discussed with Eswara)

35. (103) As per claim 17, the cellular communication system as recited in Claim 16, wherein the traffic frequencies are non-contiguous and are each separated, one from another, by at least one of the frequencies associated with the auxiliary cellular communication system. (discussed with Eswara)

36. (103) As per claim 26, the method as recited in Claim 19, wherein the traffic frequencies are non-contiguous (discussed with Eswara).

37. Claims 8, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eswara in view of Barany 6,256,486.

38. (103) As per claim 8, Eswara teaches the cellular communication system as recited in Claim 1. What Eswara does not teach is a global positioning system (GPS) satellite that communicates with the plurality of base station transceivers to synchronize the cellular communication system. What Barany 6256486 teaches is a global positioning system (GPS) satellite that communicates with the plurality of base station transceivers to synchronize the cellular communication system. (Barany paragraph 56: "To enable the creation of time groups so that they can be allocated among sectors of each cluster (100, 101, or 130) to provide higher effective channel reuse, the base stations 18 are time synchronized with each other. This may be performed by using a global positioning system (GPS) timing receiver or some other synchronization circuit 19 (FIG. 1) in each base station 18. Synchronization of the base station 18 is employed to ensure alignment of the time groups in the cell sectors. Base station synchronization is carried out such that the following two criteria are satisfied.") It would have been obvious to one skilled in the art at the time of the invention to modify Eswara with the teaching of Barany for the motivation provided in Barany.

39. (103) As per claim 33, a computer program product for facilitating communication between a mobile terminal and a base station subsystem, comprising: a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising: computer readable program code for assigning a control frequency to a cell in which the mobile terminal is located; computer readable program code for using the control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency; computer readable program code for assigning a plurality of traffic frequencies to the

cell in which the mobile terminal is located; and computer readable program code for using coordinated frequency hopping over the plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem. Eswara teaches the above limitations as discussed with respect to other claims except for computer programming. Barany teaches computer programming in paragraph 58: "The control unit 58 may be implemented with computer systems, processors, and other control devices." Barany also teaches software routines in fig. 9: 76. It would have been obvious to one skilled in the art at the time of the invention to modify Eswara with computer programming. One would be motivated to do so for efficiency.

40. (103) As per claim 34, the computer program product as recited in Claim 33, wherein the control information is exchanged during predefined control time slots and the traffic information is exchanged during predefined traffic time slots and at least one idle time slot separates at least one of the predefined control time slots from at least one of the predefined traffic time slots, which are associated with different frequencies. (discussed with Eswara and Eswara in view of Barany)

41. (103) As per claim 35, the computer program product as recited in Claim 33, wherein the coordinated frequency hopping is cyclical (discussed with Eswara and Eswara in view of Barany).

42. (103) As per claim 36, the computer program product as recited in Claim 33, wherein the coordinated frequency hopping is random (discussed with Eswara and Eswara in view of Barany).

43. (103) As per claim 37, the computer program product as recited in Claim 33, further comprising: computer readable program code for transmitting a hopping sequence to the mobile terminal using the control frequency. (discussed with Eswara and Eswara in view of Barany)

44. (103) As per claim 38, the computer program product as recited in Claim 37, wherein the computer readable program code for transmitting the hopping sequence to the mobile terminal using the control frequency comprises: computer readable program code for transmitting the hopping sequence to the mobile terminal using a primary packet broadcast control channel (PBCCH), which is defined by the control frequency and at least one time slot (discussed with Eswara and Eswara in view of Barany).

45. (103) As per claim 39, the computer program product as recited in Claim 33, wherein the plurality of traffic frequencies and the control frequency are mutually exclusive (discussed with Eswara and Eswara in view of Barany).

46. (103) As per claim 40, the computer program product as recited in Claim 33, wherein the traffic frequencies are non-contiguous (discussed with Eswara and Eswara in view of Barany).

47. (103) As per claim 42, the computer program product as recited in Claim 33, wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies (discussed with Eswara and Eswara in view of Barany).

48. (103) As per claim 43, the computer program product as recited in Claim 42, wherein the traffic frequencies are non-contiguous and are each separated, one from another, by at least one of the frequencies associated with the auxiliary cellular communication system (discussed with Eswara and Eswara in view of Barany).

49. (103) As per claim 46, the computer program product as recited in Claim 33, wherein the plurality of traffic frequencies comprise the control frequency. (discussed with Eswara and Barany such as Barany paragraph 4: "In one embodiment, the base station 18 and mobile units 20 in each cell 14 are capable of communicating with two sets of carriers--a first set of carriers 26 for communicating circuit-switched traffic (e.g., speech data, short messaging services, and other circuit-switched data) and associated control signals; and a second set of carriers 28 for communicating packet-switched data traffic and associated control signals.")

Allowable Subject Matter

50. Claims 4, 10, 20, 27, 30, 41, 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

51. Claim 49 is allowed.

52. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious for claim 49 with:

53. ***assigning an alternative control frequency to the cell in which the mobile terminal is located; using the alternative control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the alternative control frequency; assigning a plurality of alternative traffic frequencies to the cell in which the mobile terminal is located; and using coordinated***

frequency hopping over the plurality of alternative traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The examiner can normally be reached on Mon, Tues, Wed and Thurs after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (703) 306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PK

MOHAMMAD H. GHAYOUR
PRIMARY EXAMINER